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**REPORT ON
SUPPLEMENTAL
PCB INVESTIGATION
FOR WILLOW BROOK AND
WILLOW BROOK POND**



RDMS DocID 100178

**PRATT & WHITNEY
EAST HARTFORD, CT**

April 1998

Prepared for

**PRATT & WHITNEY
400 Main Street
East Hartford, Connecticut**

Prepared by

**LOUREIRO ENGINEERING ASSOCIATES
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Pratt & Whitney
A United Technologies Company

April 24, 1998

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Bureau of Waste Management
79 Elm Street
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State of Connecticut
Department of Environmental Protection
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Pratt & Whitney
CTD9906720811
R-9
RDMS # 100178

**RE: Report on Supplemental PCB Investigation
for Willow Brook and
Willow Brook Pond Sediment
NOV No. PCB 97-08**

Dear Ms. Kwiatkowski and Mr. Mason:

We are herein submitting the *Report on Supplemental PCB Investigation for Willow Brook and Willow Brook Pond* presenting the results of the supplemental investigation performed. The supplemental sampling was performed to identify potential nearby historic sources of contamination and to provide information on the vertical extent of the contamination within Willow Brook and Willow Brook Pond.

This report is being submitted as a follow up to the original *Report on PCB Investigation for Willow Brook and Willow Brook Pond Sediment dated February 18, 1998* and prepared in response to the Notice of Violation (NOV) No. PCB 97-08 issued by the State of Connecticut, Department of Environmental Protection (DEP) dated November 7, 1997.

Should you have any questions, please do not hesitate to contact me at 565-7380.

Sincerely,

PRATT & WHITNEY

Troy Charlton

Troy Charlton
Manager of Environmental Engineering
Group Environment, Health and Safety

Table of Contents

	Page
1. PURPOSE AND SCOPE	1
1.1. Previous Reports	1
1.2. Report Organization	2
2. INTRODUCTION	2
3. SAMPLING METHODOLOGY	3
3.1. Soil Sampling	3
3.2. Sediment Sampling	4
3.3. Sediment Thickness Determination	4
3.4. Sample Handling	5
3.5. Quality Assurance/Quality Control	5
3.6. Decontamination	5
3.7. Documentation	5
4. RESULTS	6
4.1. Soil Sampling	6
4.2. Sediment Sampling	6
4.3. Sediment Thickness Determination	7
5. CONCLUSIONS	7

TABLES

Table 1	Summary of Sampling and Analytical Information
Table 2	Summary of Analytical Results – Detects

DRAWINGS

Drawing No. 1	PCB Data and Sampling Locations – Willow Brook
Drawing No. 2	PCB Data and Sampling Locations – Willow Pond
Drawing No. 3	Proposed Sampling Locations

ATTACHMENTS

Attachment 1	Field Forms
Attachment 2	Laboratory Reports
Attachment 3	Listing of Analytical Results

ACRONYMS

DEP	State of Connecticut Department of Environmental Protection
DI	Deionized
DPH	State of Connecticut Department of Public Health
EPA	Environmental Protection Agency
ETAL	Experimental Test Airport Laboratory
LEA	Loureiro Engineering Associates
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
PCBs	Polychlorinated Biphenyls
PVC	Poly Vinyl Chloride
QA/QC	Quality Assurance/Quality Control
SOPs	Standard Operating Procedures
SVOCs	Semivolatile Organic Compounds
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
VOCs	Volatile Organic Compounds

1. PURPOSE AND SCOPE

The purpose of this report is to present the findings of the supplemental PCB investigation conducted on Willow Brook and Willow Brook Pond. The supplemental soil and sediment sampling was performed to identify potential nearby sources of contamination and to provide information of the vertical extent of the contamination within Willow Brook and Willow Brook Pond.

Three potential historic sources of PCB contamination were identified and investigated through the installation of soil borings. The potential source areas identified included:

- Southwestern bank of Willow Brook Pond: Infiltration or seepage from historic sludge drying beds located to the south of Willow Pond.
- Area of Former Oil Basin area, within the western section of Willow Pond: infiltration or seepage from historic operations in the area. The existing oil-water separator is currently operating in this area.
- Former Oil-Water Separator, located historically in the area between the two sections of Willow Brook Pond. Infiltration or seepage from historic operations in the area.

In-depth sampling was also performed within the eastern and western water body of Willow Brook Pond, and along Willow Brook in the vicinity of the wetlands area, and in the wetland area within Pratt & Whitney's property.

The field activities performed and the results obtained are presented in further sections of the report.

1.1. Previous Reports

This report is being submitted as a follow up to the *"Report on PCB Investigation for Willow Brook and Willow Brook Pond Sediment"* dated February 18, 1998 and prepared by Loureiro Engineering Associates (LEA). The February 18, 1998 report described the results of PCB analyses on sediment samples collected from Willow Pond and Willow Brook Pond. The sampling was performed in accordance with the *Work Plan for Willow Brook and Willow Brook Pond PCB Investigation*, prepared by LEA and dated December 12, 1997, and approved by the State of Connecticut Department of Environmental Protection (DEP) on December 22, 1997.

The Work Plan and subsequent reports were prepared in response to the Notice of Violation (NOV), No. PCB 97-08, issued by the DEP and dated November 7, 1997.

1.2. Report Organization

The report provides a brief introductory section, discusses the field investigation activities performed, making reference to the original Work Plan as appropriate, and summarizes the results obtained. A summary of sampling and analytical information is presented in Table 1 while the analytical results obtained are presented in Table 2.

Copies of the field forms are included in Attachment 1, and the laboratory reports are provided in Attachment 2. Attachment 3 contains a listing of the analytical results.

The analytical results are presented graphically in Drawing Nos. 1 (Willow Brook) and 2 (Willow Pond). For convenience, the tables and drawings presented herein include the results of the initial sediment investigation also.

2. INTRODUCTION

The Pratt & Whitney East Hartford site, is located on a level terrace of land to the east of the Connecticut River within the urban/industrial area of greater Hartford. The site is surrounded by residential and commercial land. Two small streams, Willow Brook and Pewterpot Brook, course through the property. The principal discharges from the manufacturing area of the site are directed to Willow Brook. Willow Brook has a total drainage area of two square miles. The brook is piped through much of the site in a concrete conduit which discharges into Willow Pond just north of the principal manufacturing buildings. Process water is pumped into the plant from Willow Pond and the major cooling water discharges from the manufacturing area are returned to the stream at or above the pond. The pond serves as part of the plant's water recirculation system. The water quality classification for the lower part of Willow Brook has been designated as Class B. Class B surface waters are designated for recreational use, fish and wildlife habitat, agricultural and industrial supply and other legitimate uses including navigation.

Permitted water discharges throughout the East Hartford main plant and Colt Street facilities at one point in time or another include Discharge Nos. 001 through 009, inclusive of monitoring points MP005 and MP006. These discharges were permitted under the NPDES Permit Program. The principal discharge is Discharge 001 which is the effluent discharge from the dilute wastewater treatment plant at Colt Street (Colt St WWTP). The other discharges are permitted as clean water discharges comprised mostly of cooling water and natural runoff. Only Discharge Nos. 001 through 004 and 007 through 009 are or were, associated with Willow Brook or Willow Brook Pond.

The majority of the industrial water currently drawn from Willow Pond is used in buildings where the water is collected and discharged to Willow Pond via NPDES Discharge Nos. 003 and

004 and to Willow Brook via NPDES Discharge No. 002. Industrial water is also pumped to a 400,000-gallon holding tank in the South Test Area for use as needed in South Production Test. The majority of the water used for testing engines in this area is vaporized during the test. The remainder of the water collects in a sump and discharges through an oil/water separator to the Dilute Wastewater system for treatment at the Industrial Wastewater Treatment facility and subsequent discharge through Discharge No. 001 to the Connecticut River (Colt St. WWTP). In the past when the South Test Area holding tank needed to be drained (for maintenance reasons approximately once every five years), a pipe was used to direct the water to a catch basin which eventually discharged to Pewter Pot Brook.

Sitewide discharge locations to Willow Brook and Willow Brook Pond are shown in Drawing No. 1. PCB analytical data on industrial water from Discharges 001, 002, 003, and 004 (potentially mixed with stormwater) and from Discharge 001 (Colt Street WWTP) were presented in the Work Plan.

Historically, water has discharged through the Experimental Test Airport Laboratory (ETAL) to Willow Brook upstream of Willow Pond. Basement dewatering operations and industrial waters had discharged through an oil/water separator into the brook. This building is now in the process of being demolished. Subsequently the oil/water separator was sampled and analyzed for PCB's and other parameters. The maximum total PCB concentration observed was 2 mg/kg. The analytical data from these samples has been presented in the Work Plan.

3. SAMPLING METHODOLOGY

The field activities performed during the investigation included the collection of soil samples to investigate potential sources of contamination and the performance of in-depth sediment and soil sampling within Willow Pond and Willow Brook. The field investigations were performed from March 12 to March 18, 1998 by LEA personnel and Soil Testing, Inc. of Oxford, Connecticut. These activities are further described below.

3.1. Soil Sampling

Five soil borings were installed in the vicinity of the Former Oil-Water Separator in between the two sections of Willow Pond to identify potential historic sources of PCB contamination. The soil borings were installed using a Geoprobe® to a depth of approximately 20 feet. Soil samples were collected every two feet and screened visually for the presence of oil. Three samples were submitted for analysis from each boring, including the most contaminated one based on visual observations, the deepest one, and a third one selected based on changes in soil stratigraphy or

visual observations of contamination. The samples collected were analyzed for PCBs and total organic carbon (TOC).

Four soil borings were installed in the vicinity of the area of Former Oil Basin. Two of these borings were installed on top of the bank immediately to the south of the area of Former Oil Basin using a Geoprobe®. These two borings were advanced to a depth of 20 to 24 feet. The other two were installed by hand to a depth of two to eight feet in the immediate proximity of the oil-water separator. Three soil samples from each boring were collected and analyzed for PCBs and TOC.

Four soil borings were also installed at the southwestern bank of Willow Pond downgradient of the historic sludge drying beds. The borings were advanced to a depth of 20 to 24 feet from the western bank of the pond. Soil samples were collected as described above and tested for PCBs and TOC.

3.2. Sediment Sampling

Sediment samples were collected from Willow Pond and Willow Brook to develop depth profiling information. It should be noted that only surface sediment samples were collected during the initial investigation performed utilizing a surface sediment dredger. The in-depth sediment sample collection was done by Soil Testing, Inc. of Oxford, Connecticut. A Vibra Core™ on a pontoon float was used during this sampling round to allow in depth sample collection. The core was advanced to a depth of about 8 to 10 feet within the sediment and underlying soil. A 5-foot core was used for collection of the sediment and underlying soil samples. Generally, one sediment and two soil samples of the underlying soil were selected from each sampling location within Willow Pond for PCB and TOC analysis to develop depth profiling information.

Three sediment samples were also collected from the brook and portion of the wetlands area which lies within Pratt & Whitney property. Two sediment samples were collected from each location in this area including a surface sample and one at a depth of two feet.

3.3. Sediment Thickness Determination

The thickness of the sediment was measured off a boat in selected locations along seven transects (T1 through T7) across Willow Pond and three transects (T8 through T10) across Willow Brook in the vicinity of the wetlands area. The location of the transects is indicated in Drawing Nos. 1 and 2.

3.4. Sample Handling

The soil and sediment samples were transferred directly into laboratory supplied glassware, labeled, and placed into a cooler with ice. At the completion of the sampling event, all samples were submitted for PCB analysis to a State of Connecticut Department of Public Health (DPH) certified laboratory (Accutest). Selected samples, identified in Drawing Nos. 1 and 2, were also analyzed for Total Organic Carbon (TOC). These samples were also transferred to the laboratory under full chain-of-custody control.

3.5. Quality Assurance/Quality Control

Quality Assurance/Quality Control (QA/QC) samples were collected for analysis in addition to the soil and sediment samples collected. The QA/QC samples collected included a field blank/equipment blank to determine if the decontamination procedures are adequate. Blank samples were prepared by running analyte-free deionized (DI) water through the sample collection equipment. Duplicate samples were collected at a frequency of once per day, in order to evaluate the accuracy of the analysis. The results indicated satisfactory accuracy for all parameters analyzed. Soil performance evaluation samples were also submitted to the laboratory for analysis.

3.6. Decontamination

All sampling equipment was decontaminated prior to collection of each sample. The procedures followed for decontamination included the following:

1. Remove all excess sediment from the sampling equipment,
2. Immerse sampling equipment into a solution of detergent and tap water and scrub to remove all remaining solids,
3. Immersion in DI water rinse,
4. Spray-rinse with <10% nitric acid solution,
5. Spray-rinse with DI water,
6. Spray-rinse with 10% methanol solution,
7. Air dry.

3.7. Documentation

Documentation activities performed under this sampling plan included the following:

- Field sampling forms,

- Daily field report and supplemental sheet,
- Daily field QA/QC checklist,
- Chain-of-custody forms.

Sample labels were printed and inspected for accuracy prior to the start of field activities.

4. RESULTS

The location of the soil and sediment samples collected are identified in Drawing Nos. 1 and 2 along with the samples collected during the initial sediment investigation. The analytical results are presented in Drawing Nos. 1 and 2 using a thicker border to distinguish the recent ones from the results of the initial sediment investigation.

4.1. Soil Sampling

Soil sampling was performed in three distinct locations to identify potential sources of contamination.

Low total PCB concentrations (up to about 2 mg/kg) were detected in the borings installed along the southwestern bank of Willow Pond. These concentrations do not appear to be performed indicative of a source of contamination.

PCBs were also detected in the soils collected from the four soil borings placed in the vicinity of the Former Oil Basin. The highest total PCB concentrations observed were of the order of 1.3 mg/kg, observed in location WT-HB-84 at a depth of 0-2 feet.

Elevated total PCB concentrations were observed in the soil borings collected between the two sections of Willow Pond, in the location of the Former Oil-Water Separator. The total PCB concentration observed in this area ranged up to 128 mg/kg at location WT-SB-88 at a depth of 10 to 12 feet. Free oil was also observed in this location. The highest PCB concentrations were observed at a depth of approximately 8 to 12 feet below the surface of the ground corresponding approximately to the depth of the water and sediment within the pond, and the approximate level of the water table in the area.

4.2. Sediment Sampling

Detected total PCB concentrations within the two sections of Willow Pond (east and west) ranged in concentrations up to 258 mg/kg in the upper 0 to 2 feet interval. The highest concentration was observed in location WT-SD-72 near the pond's effluent point. Approximately 73.5 mg/kg of total PCBs were detected at a depth interval of 2-4 feet in location

WT-SD-78 located at the eastern portion of Willow Pond. Significantly lower and/or non-detectable levels were observed at greater depths.

PCB concentrations remained at detectable levels at certain locations at depths up to 8 or 12 feet. The presence of these low levels of contamination at these depths may be attributed to potential carryover of PCB-contaminated material as the liner was retrieved from the pond.

The total PCB concentrations detected in Willow Brook in the vicinity of the wetlands area and within the wetlands ranged in concentrations up to 299 mg/kg observed on a surface sample (0-6 inches) collected from location WT-SD-92. The total PCB concentration observed at a depth interval of 1.5 to 2.0 feet at this location (WT-SD-92) was significantly lower (2.6 mg/kg). Total PCB concentrations of about 44 mg/kg (WT-SD-95) and 46 mg/kg (WT-SD-93) were observed in the other two surface samples collected in this area. The total PCB concentrations observed at the other two locations (WT-SD-95 and WT-SD-93) at a depth interval of 1.5 to 2.0 feet were 4.6 and 5.7 mg/kg correspondingly.

4.3. Sediment Thickness Determination

The sediment thickness observed within Willow Pond ranged up to 4 feet in certain locations while the amount of sediment in the brook was less than 1 foot. The sediment depth measurements for Willow Brook and Willow Pond are shown on Drawing Nos. 1 and 2.

5. CONCLUSIONS

Supplemental soil and sediment sampling was performed to identify potential sources of contamination and provide in-depth profiling information within Willow Pond and Willow Brook.

The results obtained identified the presence of PCB contamination in the area of the Former Oil-Water Separator between the two sections of Willow Pond.

Significantly lower levels of contamination were observed in the other two areas investigated (southwestern bank of Willow Pond and area of Former Oil Basin).

PCB contamination and the presence of free oil was also identified in the sediment samples collected in the portion of the wetlands area which lies within Pratt & Whitney property.

Additional investigations are proposed below, focusing on the areas where the highest levels of PCB contamination were identified. The proposed investigations include the following:

- The installation of soil borings and monitoring wells is proposed in the vicinity of Willow Pond and the Former Oil-Water Separator to investigate the extent of contamination. Approximately, three soil samples will be submitted for analysis from each soil boring installed around Willow Pond. The samples will be submitted for analysis for PCBs, TPH, VOCs, SVOCs, and metals (As, Ba, Cd, Cr, Pb, Hg, Ag, Se, and Ni). The installation of monitoring wells will allow subsequent monitoring of groundwater quality in the area. The ½" PVC prepacked screen monitoring wells will be installed with a Geoprobe® and will be developed and surveyed. One round of groundwater samples will be collected from each monitoring well and analyzed for the same parameters as for the soil.
- The collection of additional sediment samples is proposed from Willow Brook and adjacent residential properties to assess the extent of contamination along Willow Brook and the wetlands area. In-depth sampling will be performed in selected locations to obtain depth profiling information. The samples collected will be submitted for analysis for the same parameters as listed above. The proposed sampling locations are shown in Drawing No. 3.

The sampling activities would be performed in accordance with LEA's standard operating procedures for *Geoprobe Probing and Sampling*, *Hand Auger Borings*, and *Soil Sampling*. The standard operating procedures for *Installing and Developing Monitoring Wells and Piezometers*, and for *Liquid Sample Collection and Field Analysis*, are provided in Attachment 4. Sample handling, QA/QC, decontamination and documentation procedures will be consistent with the ones described in the *Work Plan for Willow Brook Pond PCB Investigation*. A timeline for the proposed investigations is provided in Figure 1.

TABLES

Table 1

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

Page 1 of 5

Sample Information					Analysis Information									
Location ID	Sample ID	Sample Date	From (ft)	To (ft)	Class	Portable GC	Volatile Organics	Semivolatile Organics	Herbicides	Pesticides	PCBs	Metals	Extraction	Miscellaneous
CS-SD-60	1653137	1/15/98			SD						X			
CS-SD-61	1653138	1/15/98	4		SD						X			
CS-SD-62	1653140	1/15/98			SD						X			
CS-SD-63	1653139	1/15/98			SD		X				X			
CS-SD-64	1653141	1/15/98			SD						X			
CS-SD-65	1653142	1/15/98			SD						X			
CS-SD-66	1653143	1/15/98			SD						X			
CS-SD-66	1653144	1/15/98			SD						X			
WT-HB-84	1655947	3/18/98	0	2	SB						X			
WT-HB-84	1655949	3/18/98	4	6	SB						X			
WT-HB-84	1655950	3/18/98	6	8	SB						X			X
WT-HB-87	1655951	3/18/98	0	2	SB						X			
WT-HB-87	1655952	3/18/98	0	2	SB						X			
WT-SB-80	1655921	3/17/98	0	4	SB						x			
WT-SB-80	1655924	3/17/98	8	10	SB						x			
WT-SB-81	1655745	3/17/98	2	4	SB						X			X
WT-SB-81	1655753	3/17/98	10	12	SB						X			
WT-SB-81	1655755	3/17/98	14	16	SB						X			X
WT-SB-82	1655711	3/16/98	2	4	SB						X			
WT-SB-82	1655717	3/16/98	14	16	SB						x			
WT-SB-82	1655721	3/16/98	22	24	SB						x			
WT-SB-83	1655723	3/16/98	2	4	SB						X			
WT-SB-83	1655725	3/16/98	6	8	SB						X			
WT-SB-83	1655729	3/16/98	14	16	SB						x			
WT-SB-83	1655733	3/16/98	22	24	SB						x			
WT-SB-85	1655701	3/16/98	8	10	SB						x			X
WT-SB-85	1655702	3/16/98	8	10	SB						x			
WT-SB-85	1655706	3/16/98	16	18	SB						x			
WT-SB-85	1655709	3/16/98	22	24	SB						x			
WT-SB-86	1655681	3/13/98	2	4	SB						x			X
WT-SB-86	1655685	3/13/98	10	12	SB						x			

Notes: 1. Legend: X - Analysed; at least one analyte over the detection limit; x - Analysed, no analytes in group over the detection limit

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Table 1

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

Page 2 of 5

Sample Information					Analysis Information									
Location ID	Sample ID	Sample Date	From (ft)	To (ft)	Class	Portable GC	Volatile Organics	Semivolatile Organics	Herbicides	Pesticides	PCBs	Metals	Extraction	Miscellaneous
WT-SB-86	1655689	3/13/98	18	20	SB						x			X
WT-SB-88	1655653	3/12/98	4	6	SB						X			
WT-SB-88	1655656	3/12/98	10	12	SB						X			X
WT-SB-88	1655660	3/12/98	18	20	SB						x			
WT-SB-89	1655662	3/13/98	2	4	SB						X			X
WT-SB-89	1655664	3/13/98	6	8	SB						X			X
WT-SB-89	1655665	3/13/98	6	8	SB						X			
WT-SB-89	1655669	3/13/98	14	16	SB						x			
WT-SB-90	1655673	3/13/98	6	8	SB						X			
WT-SB-90	1655676	3/13/98	12	14	SB						X			
WT-SB-90	1655679	3/13/98	18	20	SB						X			
WT-SB-91	1655649	3/12/98	8	10	SB						X			
WT-SB-91A	1655635	3/18/98	2	4	SB						X			X
WT-SB-91A	1655641	3/18/98	12	14	SB						X			X
WT-SB-91A	1655644	3/18/98	18	20	SB		X	X			x	X		
WT-SD-06	1653123	1/14/98			SD						X	X		X
WT-SD-07	1653075	1/12/98			SD						X			
WT-SD-08	1653076	1/12/98			SD						X			
WT-SD-09	1653124	1/14/98			SD		x	X			X	X		X
WT-SD-09	1653125	1/14/98			SD		x	X			X	X		X
WT-SD-10	1653081	1/12/98			SD						X			
WT-SD-11	1653119	1/13/98			SD						X			
WT-SD-12	1653120	1/13/98			SD						X			
WT-SD-13	1653077	1/12/98			SD						X			
WT-SD-14	1653082	1/12/98			SD						X			
WT-SD-15	1653117	1/13/98			SD						X			
WT-SD-16	1653118	1/13/98			SD						X			
WT-SD-17	1653079	1/12/98			SD						X			
WT-SD-18	1653088	1/13/98			SD						X			
WT-SD-19	1653116	1/13/98			SD						X			
WT-SD-20	1653080	1/12/98			SD						X			
WT-SD-21	1653089	1/13/98			SD						X			

Notes: 1. Legend: X - Analysed; at least one analyte over the detection limit; x - Analysed, no analytes in group over the detection limit

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Table 1

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

Page 3 of 5

Sample Information						Analysis Information								
Location ID	Sample ID	Sample Date	From (ft)	To (ft)	Class	Portable GC	Volatile Organics	Semivolatile Organics	Herbicides	Pesticides	PCBs	Metals	Extraction	Miscellaneous
WT-SD-22	1653115	1/13/98			SD						X			
WT-SD-23	1653091	1/13/98			SD						X			
WT-SD-24	1653090	1/13/98			SD						X			
WT-SD-25	1653114	1/13/98			SD						X			
WT-SD-26	1653092	1/13/98			SD						X			
WT-SD-27	1653113	1/13/98			SD						X			
WT-SD-28	1653094	1/13/98			SD						X			
WT-SD-29	1653095	1/13/98			SD						X			
WT-SD-30	1653093	1/13/98			SD						X			
WT-SD-31	1653098	1/13/98			SD						X			
WT-SD-32	1653096	1/13/98			SD						X			
WT-SD-33	1653097	1/13/98			SD		x	x	x	x	X	X		X
WT-SD-34	1653083	1/12/98			SD						X			
WT-SD-35	1653084	1/12/98			SD		x	x	x	x	X	X		X
WT-SD-36	1653085	1/12/98			SD						X			
WT-SD-36	1653086	1/12/98			SD						X			
WT-SD-37	1653112	1/13/98			SD						X			
WT-SD-38	1653110	1/13/98			SD						X			
WT-SD-38	1653111	1/13/98			SD						X			
WT-SD-39	1653099	1/13/98			SD		x	x	x	x	X	X		X
WT-SD-39	1653101	1/13/98			SD						X			
WT-SD-40	1653100	1/13/98			SD						X			
WT-SD-41	1653109	1/13/98			SD						X			
WT-SD-42	1653102	1/13/98			SD						X			
WT-SD-43	1653103	1/13/98			SD						X			
WT-SD-44	1653108	1/13/98			SD						X			
WT-SD-45	1653104	1/13/98			SD						X			
WT-SD-46	1653105	1/13/98			SD						X			
WT-SD-47	1653127	1/14/98			SD		X	X			X	X		X
WT-SD-48	1653106	1/13/98			SD						X			
WT-SD-49	1653107	1/13/98			SD						X			
WT-SD-50	1653087	1/12/98			SD						X			

Notes: 1. Legend: X - Analysed; at least one analyte over the detection limit; x - Analysed, no analytes in group over the detection limit
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Table 1

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

Page 4 of 5

Sample Information						Analysis Information								
Location ID	Sample ID	Sample Date	From (ft)	To (ft)	Class	Portable GC	Volatile Organics	Semivolatile Organics	Herbicides	Pesticides	PCBs	Metals	Extraction	Miscellaneous
WT-SD-51	1653128	1/14/98			SD						X			
WT-SD-52	1653129	1/14/98			SD						X			
WT-SD-53	1653130	1/14/98			SD						X			
WT-SD-54	1653131	1/14/98			SD						X			
WT-SD-55	1653132	1/14/98			SD						X			
WT-SD-56	1653133	1/14/98			SD		x	X			X	X		X
WT-SD-57	1653134	1/14/98			SD						X			
WT-SD-58	1653135	1/14/98			SD						X			
WT-SD-59	1653136	1/14/98			SD						X			
WT-SD-67	1653122	1/13/98			SD						X			
WT-SD-68	1653074	1/12/98			SD						X			
WT-SD-69	1653078	1/12/98			SD						X			
WT-SD-70	1653073	1/12/98	3		SD						X			
WT-SD-71	1653121	1/13/98			SD						X			
WT-SD-72	1655941	3/18/98	0	2	SD						X			X
WT-SD-72	1655945	3/18/98	8	10	SD						x			x
WT-SD-72	1655946	3/18/98	10	12	SD						X			X
WT-SD-73	1655935	3/18/98	0	2	SD						X			X
WT-SD-73	1655936	3/18/98	0	2	SD						X			X
WT-SD-73	1655938	3/18/98	4	6	SD						x			
WT-SD-73	1655940	3/18/98	8	10	SD						x			
WT-SD-74	1655930	3/18/98	0	2	SD						X			X
WT-SD-74	1655932	3/18/98	4	6	SD						X			
WT-SD-74	1655934	3/18/98	8	10	SD						x			
WT-SD-75	1655917	3/17/98	0	2	SD						X			X
WT-SD-75	1655919	3/17/98	4	6	SD						X			
WT-SD-75	1655920	3/17/98	6	8.0	SB						X			
WT-SD-76	1655955	3/18/98	0	2	SD						X			
WT-SD-76	1655956	3/18/98	2	4	SD						X			
WT-SD-77	1655748	3/17/98	0	2	SD						X			X
WT-SD-77	1655751	3/17/98	6	9	SD						x			
WT-SD-78	1655741	3/17/98	2	4	SD						X			

Notes: 1. Legend: X - Analysed; at least one analyte over the detection limit; x - Analysed, no analytes in group over the detection limit

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Table 1

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

Page 5 of 5

Sample Information						Analysis Information								
Location ID	Sample ID	Sample Date	From (ft)	To (ft)	Class	Portable GC	Volatile Organics	Semivolatile Organics	Herbicides	Pesticides	PCBs	Metals	Extraction	Miscellaneous
WT-SD-78	1655743	3/17/98	8.0	9.5	SD						X			
WT-SD-79	1655735	3/17/98	0	2	SD						X			X
WT-SD-79	1655737	3/17/98	4	6	SD						X			
WT-SD-79	1655739	3/17/98	8	9.5	SD						x			
WT-SD-92	1655690	3/13/98	0	.5	SD						X			
WT-SD-92	1655691	3/13/98	1.5	2.0	SB						X			X
WT-SD-93	1655692	3/13/98	0.0	0.5	SD						X			
WT-SD-93	1655693	3/13/98	1.5	2.0	SB						X			
WT-SD-95	1655694	3/13/98	0.0	0.5	SD						X			
WT-SD-95	1655695	3/13/98	1.5	2.0	SB						X			X

Notes: 1. Legend: X - Analysed; at least one analyte over the detection limit; x - Analysed, no analytes in group over the detection limit
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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION Willow Brook/Willow Pond

Page 1 of 36

Constituent	Location ID	CS-SD-60	CS-SD-61	CS-SD-62	CS-SD-63	CS-SD-64	CS-SD-65	CS-SD-66
Date Metals Analyzed	Sample ID	1653137	1653138	1653140	1653139	1653141	1653142	1653143
Date Organics Analyzed	Sample Date	01/15/1998	01/15/1998	01/15/1998	01/15/1998	01/15/1998	01/15/1998	01/15/1998
Date PCBs Analyzed	Sample Time	:	11:25	11:45	11:59	12:15	12:25	12:35
Date Semi-volatile Organics Analyzed	Sample Depth							
Arsenic	Laboratory	accu	accu	accu	accu	accu	accu	accu
Barium	Lab. Number	E29892-1	E29892-2	E29892-4	E29892-3	E29892-5	E29892-6	E29892-7
Cadmium	Units							
Chromium	-							
Lead	-							
Mercury	mg/kg							
Nickel	mg/kg							
Silver	mg/kg							
Zinc	mg/kg							
PCB 1248	µg/kg							
PCB 1254	µg/kg	418	509	514	722	503	127	423
PCB 1260	µg/kg	141	252	193	222	248	56.1	178
Ignitability	Deg.							
Total Organic Carbon	mg/kg							
Total Petroleum Hydrocarbons	mg/kg							
pH (Corrosivity)	-							
Acenaphthene	µg/kg							
Acenaphthylene	µg/kg							
Anthracene	µg/kg							
Benzo[a]anthracene	µg/kg							
Benzo[a]pyrene	µg/kg							
Benzo[b]fluoranthene	µg/kg							
Benzo[ghi]perylene	µg/kg							
Benzo[k]fluoranthene	µg/kg							

Notes: 1. Only Detects Shown
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Table 2
SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION
Willow Brook/Willow Pond

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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION Willow Brook/Willow Pond

Page 3 of 36

Constituent	Location ID	CS-SD-66	WT-HB-84	WT-HB-84	WT-HB-84	WT-HB-84	WT-HB-87	WT-HB-87	WT-SB-81
Sample ID		1653144	1655947	1655949	1655950	1655951	1655952	1655952	1655745
Sample Date		01/15/1998	03/18/1998	03/18/1998	03/18/1998	03/18/1998	03/18/1998	03/18/1998	03/17/1998
Sample Time		12:50	11:00	11:30	11:45	14:00	14:00	14:00	14:41
Sample Depth			0' - 2'	4' - 6'	6' - 8'	0' - 2'	0' - 2'	0' - 2'	2' - 4'
Laboratory		accu	accu	accu	accu	accu	accu	accu	accu
Lab. Number		E29892-8	E32169-18	E32169-20	E32169-21	E32169-22	E32169-23	E32168-11	
Units									
Date Metals Analyzed	-								
Date Organics Analyzed	-								
Date PCBs Analyzed	-	01/21/1998	03/25/1998	03/25/1998	03/25/1998	03/25/1998	03/25/1998	03/25/1998	03/21/1998
Date Semi-volatile Organics Analyzed	-								
Arsenic	mg/kg								
Barium	mg/kg								
Cadmium	mg/kg								
Chromium	mg/kg								
Lead	mg/kg								
Mercury	mg/kg								
Nickel	mg/kg								
Silver	mg/kg								
Zinc	mg/kg								
PCB 1248	µg/kg								
PCB 1254	µg/kg	576	954	62.1	309	410	421	421	55.1
PCB 1260	µg/kg	217	365	20	25.6	55.2	45.2	45.2	21.4
Ignitability	Deg.								
Total Organic Carbon	mg/kg				9780				8400
Total Petroleum Hydrocarbons	mg/kg								
pH (Corrosivity)	-								
Acenaphthene	µg/kg								
Acenaphthylene	µg/kg								
Anthracene	µg/kg								
Benzo[a]anthracene	µg/kg								
Benzo[a]pyrene	µg/kg								
Benzo[b]fluoranthene	µg/kg								
Benzo[ghi]perylene	µg/kg								
Benzo[k]fluoranthene	µg/kg								

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SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

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SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION Willow Brook/Willow Pond

Page 5 of 36

	Location ID	WT-SB-81	WT-SB-81	WT-SB-81	WT-SB-82	WT-SB-83	WT-SB-83	WT-SB-85	WT-SB-86
	Sample ID	1655753	1655755	1655711	1655723	1655701	1655681		
	Sample Date	03/17/1998	03/17/1998	03/16/1998	03/16/1998	03/16/1998	03/13/1998		
	Sample Time	15:26	15:36	14:21	15:41	13:00	15:01		
	Sample Depth	10' - 12'	14' - 16'	2' - 4'	2' - 4'	8' - 10'	2' - 4'		
	Laboratory	accu	accu	accu	accu	accu	accu		
	Lab. Number	E32168-19	E32168-21	E32236-6	E32236-11	E32236-2	E32062-15		
Constituent	Units								
Date Metals Analyzed	-								
Date Organics Analyzed	-								
Date PCBs Analyzed	-	03/21/1998	03/26/1998	03/26/1998	03/26/1998				
Date Semi-volatile Organics Analyzed	-								
Arsenic	mg/kg								
Barium	mg/kg								
Cadmium	mg/kg								
Chromium	mg/kg								
Lead	mg/kg								
Mercury	mg/kg								
Nickel	mg/kg								
Silver	mg/kg								
Zinc	mg/kg								
PCB 1248	µg/kg								
PCB 1254	µg/kg	25.7	49.7	1670	112				
PCB 1260	µg/kg			527	71.3	40.7			
Ignitability	Deg.								
Total Organic Carbon	mg/kg		28800			2260	13100		
Total Petroleum Hydrocarbons	mg/kg								
pH (Corrosivity)	-								
Acenaphthene	µg/kg								
Acenaphthylene	µg/kg								
Anthracene	µg/kg								
Benzo[a]anthracene	µg/kg								
Benzo[a]pyrene	µg/kg								
Benzo[b]fluoranthene	µg/kg								
Benzo[ghi]perylene	µg/kg								
Benzo[k]fluoranthene	µg/kg								

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SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION **Willow Brook/Willow Pond**

Page 7 of 36

	Location ID	WT-SB-86	WT-SB-88	WT-SB-88	WT-SB-88	WT-SB-89	WT-SB-89	WT-SB-89	WT-SB-89	WT-SB-90
	Sample ID	1655689	1655653	1655656	1655662	1655664	1655665	1655673		
	Sample Date	03/13/1998	03/12/1998	03/12/1998	03/13/1998	03/13/1998	03/13/1998	03/13/1998		
	Sample Time	15:41	14:50	15:16	10:41	11:41	11:42	14:11		
	Sample Depth	18' - 20'	4' - 6'	10' - 12'	2' - 4'	6' - 8'	6' - 8'	6' - 8'		
	Laboratory	accu	accu	accu	accu	accu	accu	accu		
	Lab. Number	E32062-17	E32062-5	E32062-6	E32062-8	E32062-9	E32062-10	E32062-12		
Constituent	Units									
Date Metals Analyzed	-									
Date Organics Analyzed	-									
Date PCBs Analyzed	-		03/19/1998	03/23/1998	03/23/1998	03/23/1998	03/19/1998	03/23/1998		
Date Semi-volatile Organics Analyzed	-									
Arsenic	mg/kg									
Barium	mg/kg									
Cadmium	mg/kg									
Chromium	mg/kg									
Lead	mg/kg									
Mercury	mg/kg									
Nickel	mg/kg									
Silver	mg/kg									
Zinc	mg/kg									
PCB 1248	µg/kg		46	42200	1960	11600	5390	55500		
PCB 1254	µg/kg		32.5	52600	4100	15400	7420	58600		
PCB 1260	µg/kg			33100	1430	2740	908	7330		
Ignitability	Deg.									
Total Organic Carbon	mg/kg	1360		17800	10900	20400				
Total Petroleum Hydrocarbons	mg/kg									
pH (Corrosivity)	-									
Acenaphthene	µg/kg									
Acenaphthylene	µg/kg									
Anthracene	µg/kg									
Benzofluoranthene	µg/kg									
Benzofluoranthene	µg/kg									
Benzofluoranthene	µg/kg									
Benzofluoranthene	µg/kg									
Benzofluoranthene	µg/kg									
Benzofluoranthene	µg/kg									

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SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

Page 8 of 36

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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION **Willow Brook/Willow Pond**

Page 9 of 36

	Location ID	WT-SB-90	WT-SB-90	WT-SB-91	WT-SB-91A	WT-SB-91A	WT-SB-91A	WT-SD-06	WT-SD-07
	Sample ID	1655676	1655679	1655649	1655635	1655641	1653123	1653075	
	Sample Date	03/13/1998	03/13/1998	03/12/1998	03/18/1998	03/18/1998	01/14/1998	01/12/1998	
	Sample Time	14:30	14:46	14:00	10:41	11:40	:	14:12	
	Sample Depth	12' - 14'	18' - 20'	8' - 10'	2' - 4'	12' - 14'			
	Laboratory	accu	accu	accu	accu	accu	accu	accu	
	Lab. Number	E32062-13	E32062-14	E32062-3	E32062-1	E32062-2	E29836-1	E29782-3	
Constituent	Units								
Date Metals Analyzed	-						01/21/1998		
Date Organics Analyzed	-						01/16/1998		
Date PCBs Analyzed	-	03/20/1998	03/23/1998	03/19/1998	03/19/1998	03/19/1998	01/19/1998	01/20/1998	
Date Semi-volatile Organics Analyzed	-						01/16/1998		
Arsenic	mg/kg								
Barium	mg/kg						30		
Cadmium	mg/kg						2.5		
Chromium	mg/kg						27.8		
Lead	mg/kg						39.2		
Mercury	mg/kg						0.14		
Nickel	mg/kg						47.8		
Silver	mg/kg						4.3		
Zinc	mg/kg						118		
PCB 1248	µg/kg	12200			26.3	935	62.7	652	
PCB 1254	µg/kg	14700		29.7	25.2	1650	642	2290	
PCB 1260	µg/kg	1350	31.4			342	430	1070	
Ignitability	Deg.								
Total Organic Carbon	mg/kg				23300	11800			
Total Petroleum Hydrocarbons	mg/kg						268		
pH (Corrosivity)	-								
Acenaphthene	µg/kg						42.4		
Acenaphthylene	µg/kg						26.9 J		
Anthracene	µg/kg						117		
Benzo[a]anthracene	µg/kg						554		
Benzo[a]pyrene	µg/kg						639		
Benzo[b]fluoranthene	µg/kg						716		
Benzo[ghi]perylene	µg/kg						518		
Benzo[k]fluoranthene	µg/kg						487		

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Table 2
SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION
Willow Brook/Willow Pond

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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION **Willow Brook/Willow Pond**

Page 11 of 36

Constituent	Location ID	WT-SD-08	WT-SD-09	WT-SD-09	WT-SD-09	WT-SD-10	WT-SD-11	WT-SD-12	WT-SD-13
Date Metals Analyzed	Sample ID	1653076	1653124	1653125	1653081	1653119	1653120	1653077	
Date Organics Analyzed	Sample Date	01/12/1998	01/14/1998	01/14/1998	01/12/1998	01/13/1998	01/13/1998	01/12/1998	
Date PCBs Analyzed	Sample Time	14:15	10:00	10:00	15:01	15:10	15:15	14:35	
Date Semi-volatile Organics Analyzed	Sample Depth								
Arsenic	Laboratory	ACCU	ACCU	ACCU	ACCU	ACCU	ACCU	ACCU	
Barium	Lab. Number	E29782-4	E29836-2	E29836-3	E29782-9	E29784-32	E29784-33	E29782-5	
Cadmium	Units								
Chromium	-		01/21/1998	01/21/1998	01/19/1998	01/18/1998	01/20/1998	01/19/1998	
Lead	-								
Mercury	-								
Nickel	-	01/19/1998	01/19/1998	01/19/1998	01/19/1998	01/19/1998			
Silver	mg/kg		6.5	5.9					
Zinc	mg/kg		214	199					
PCB 1248	mg/kg		30.3	33.4					
PCB 1254	mg/kg		490	497					
PCB 1260	mg/kg		714	691					
Ignitability	mg/kg		5.1	3.5					
Total Organic Carbon	mg/kg		595	593					
Total Petroleum Hydrocarbons	mg/kg		139	132					
pH (Corrosivity)	Deg.		772	689					
Acenaphthene	mg/kg		3090	5860	9530	373	1400	288	
Acenaphthylene	mg/kg		10800	13900	15500	613	2940	777	
Anthracene	mg/kg		8490	8960	17400	505	2390	978	
Benzo[a]anthracene	mg/kg								
Benzo[a]pyrene	mg/kg		4340	3930					
Benzo[b]fluoranthene	mg/kg		612	828					
Benzo[ghi]perylene	mg/kg		370	448					
Benzo[k]fluoranthene	mg/kg		1600	2150					
	mg/kg		7170	9360					
	mg/kg		8180	11200					
	mg/kg		9880	12900					
	mg/kg		7850	10600					
	mg/kg		4480	6350					

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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

Page 12 of 36

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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION Willow Brook/Willow Pond

Page 13 of 36

	Location ID	WT-SD-14	WT-SD-15	WT-SD-16	WT-SD-17	WT-SD-18	WT-SD-19	WT-SD-20
	Sample ID	1653082	1653117	1653118	1653079	1653088	1653116	1653080
	Sample Date	01/12/1998	01/13/1998	01/13/1998	01/12/1998	01/13/1998	01/13/1998	01/12/1998
	Sample Time	15:06	14:50	14:55	14:54	09:30	14:15	14:55
	Sample Depth							
	Laboratory	accu	accu	accu	accu	accu	accu	accu
	Lab. Number	E29782-10	E29784-30	E29784-31	E29782-7	E29784-1	E29784-29	E29782-8
Constituent	Units							
Date Metals Analyzed	-							
Date Organics Analyzed	-							
Date PCBs Analyzed	-	01/19/1998	01/18/1998	01/18/1998	01/19/1998	01/17/1998	01/18/1998	01/19/1998
Date Semi-volatile Organics Analyzed	-							
Arsenic	mg/kg							
Barium	mg/kg							
Cadmium	mg/kg							
Chromium	mg/kg							
Lead	mg/kg							
Mercury	mg/kg							
Nickel	mg/kg							
Silver	mg/kg							
Zinc	mg/kg							
PCB 1248	µg/kg	13900	2440	643	5420	1710	719	2080
PCB 1254	µg/kg	21800	2600	784	4930	5360	904	9900
PCB 1260	µg/kg	11900	2740	823	3580	2540	763	9000
Ignitability	Deg.							
Total Organic Carbon	mg/kg							
Total Petroleum Hydrocarbons	mg/kg							
pH (Corrosivity)	-							
Acenaphthene	µg/kg							
Acenaphthylene	µg/kg							
Anthracene	µg/kg							
Benzo[a]anthracene	µg/kg							
Benzo[a]pyrene	µg/kg							
Benzo[b]fluoranthene	µg/kg							
Benzo[ghi]perylene	µg/kg							
Benzo[k]fluoranthene	µg/kg							

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SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION Willow Brook/Willow Pond

Page 15 of 36

	Location ID	WT-SD-21	WT-SD-22	WT-SD-23	WT-SD-24	WT-SD-25	WT-SD-26	WT-SD-27
Sample ID	1653089	1653115	1653091	1653090	1653114	1653092	1653113	
Sample Date	01/13/1998	01/13/1998	01/13/1998	01/13/1998	01/13/1998	01/13/1998	01/13/1998	01/13/1998
Sample Time	09:35	14:10	09:45	09:40	14:05	09:55	14:00	
Sample Depth								
Laboratory	accu	accu	accu	accu	accu	accu	accu	accu
Lab. Number	E29784-2	E29784-28	E29784-4	E29784-3	E29784-27	E29784-5	E29784-26	
Constituent	Units							
Date Metals Analyzed	-							
Date Organics Analyzed	-							
Date PCBs Analyzed	-	01/17/1998	01/20/1998	01/19/1998	01/17/1998	01/18/1998	01/17/1998	01/18/1998
Date Semi-volatile Organics Analyzed	-							
Arsenic	mg/kg							
Barium	mg/kg							
Cadmium	mg/kg							
Chromium	mg/kg							
Lead	mg/kg							
Mercury	mg/kg							
Nickel	mg/kg							
Silver	mg/kg							
Zinc	mg/kg							
PCB 1248	µg/kg	555	1530	2890	340	1180	569	1240
PCB 1254	µg/kg	1490	3050	3880	592	1250	848	1580
PCB 1260	µg/kg	1580	2480	4970	443	909	760	1100
Ignitability	Deg.							
Total Organic Carbon	mg/kg							
Total Petroleum Hydrocarbons	mg/kg							
pH (Corrosivity)	-							
Acenaphthene	µg/kg							
Acenaphthylene	µg/kg							
Anthracene	µg/kg							
Benzo[a]anthracene	µg/kg							
Benzo[a]pyrene	µg/kg							
Benzo[b]fluoranthene	µg/kg							
Benzo[k]fluoranthene	µg/kg							
Benzo[e]fluoranthene	µg/kg							

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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION Willow Brook/Willow Pond

Page 17 of 36

Constituent	Location ID	WT-SD-28	WT-SD-29	WT-SD-30	WT-SD-31	WT-SD-32	WT-SD-33	WT-SD-33
Sample ID	163094	163095	163093	163098	163096	163097	163097	163097
Sample Date	01/13/1998	01/13/1998	01/13/1998	01/13/1998	01/13/1998	01/13/1998	01/13/1998	01/13/1998
Sample Time	10:10	10:17	10:00	10:45	10:20	10:25	10:25	10:25
Sample Depth								
Laboratory	accu	accu	accu	accu	accu	accu	accu	accu
Lab. Number	E29784-7	E29784-8	E29784-6	E29784-11	E29784-9	E29784-10	E29784-10R	E29784-10R
Units								
Date Metals Analyzed	-							01/29/1998
Date Organics Analyzed	-							
Date PCBs Analyzed	-	01/19/1998	01/17/1998	01/19/1998	01/20/1998	01/21/1998		
Date Semi-volatile Organics Analyzed	-							
Arsenic	mg/kg							
Barium	mg/kg							
Cadmium	mg/kg							0.021
Chromium	mg/kg							
Lead	mg/kg							
Mercury	mg/kg							
Nickel	mg/kg							
Silver	mg/kg							
Zinc	mg/kg							
PCB 1248	µg/kg	886	1040	11300	5590	3300	154000	
PCB 1254	µg/kg	6580	1840	12000	7980	7660	193000	
PCB 1260	µg/kg	5940	1980	3640	1850	7950	270000	
Ignitability	Deg.							>200
Total Organic Carbon	mg/kg							
Total Petroleum Hydrocarbons	mg/kg							
pH (Corrosivity)	-							0.5.4 NC
Acenaphthene	µg/kg							
Acenaphthylene	µg/kg							
Anthracene	µg/kg							
Benzo[a]anthracene	µg/kg							
Benzo[a]pyrene	µg/kg							
Benzo[b]fluoranthene	µg/kg							
Benzo[ghi]perylene	µg/kg							
Benzo[k]fluoranthene	µg/kg							

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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

Page 18 of 36

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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION Willow Brook/Willow Pond

Page 19 of 36

Constituent	Location ID	WT-SD-34	WT-SD-35	WT-SD-35	WT-SD-36	WT-SD-36	WT-SD-36	WT-SD-37	WT-SD-38
Date Metals Analyzed	Sample ID	1653083	1653084	1653084	1653085	1653086	1653112	1653110	
Date Organics Analyzed	Sample Date	01/12/1998	01/12/1998	01/12/1998	01/12/1998	01/12/1998	01/13/1998	01/13/1998	
Date PCBs Analyzed	Sample Time	15:42	16:36	16:36	16:40	16:40	13:45	13:40	
Date Semi-volatile Organics Analyzed	Sample Depth								
Arsenic	Laboratory	accu	accu	accu	accu	accu	accu	accu	
Barium	Lab. Number	E29782-11	E29782-12	E29782-12R	E29782-13	E29782-14	E29784-25	E29784-23	
Cadmium	Units								
Chromium	-			01/29/1998					
Lead	-								
Mercury	-								
Nickel	-	01/17/1998	01/19/1998		01/20/1998	01/20/1998	01/20/1998	01/18/1998	
Silver	mg/kg								
Zinc	mg/kg								
PCB 1248	mg/kg	737	10100		1140	1180	4470	577	
PCB 1254	mg/kg	1260	29600		1960	3060	5600	599	
PCB 1260	mg/kg	1220	13100		4330	4600	5600	391	
Ignitability	Deg.			>200					
Total Organic Carbon	mg/kg								
Total Petroleum Hydrocarbons	mg/kg								
pH (Corrosivity)	-			0.6.4 NC					
Acenaphthene	µg/kg								
Acenaphthylene	µg/kg								
Anthracene	µg/kg								
Benzo[a]anthracene	µg/kg								
Benzo[a]pyrene	µg/kg								
Benzo[b]fluoranthene	µg/kg								
Benzo[ghi]perylene	µg/kg								
Benzo[k]fluoranthene	µg/kg								

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SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

Page 20 of 36

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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

Page 21 of 36

	Location ID	WT-SD-38	WT-SD-39	WT-SD-39	WT-SD-39	WT-SD-40	WT-SD-41	WT-SD-42
Sample ID	1653111	1653099	1653099	1653101	1653100	1653109	1653102	
Sample Date	01/13/1998	01/13/1998	01/13/1998	01/13/1998	01/13/1998	01/13/1998	01/13/1998	
Sample Time	13:40	10:55	10:55	10:55	11:00	13:35	11:05	
Sample Depth								
Laboratory	accu	accu	accu	accu	accu	accu	accu	
Lab. Number	E29784-24	E29784-12	E29784-12R	E29784-14	E29784-13	E29784-22	E29784-15	
Constituent	Units							
Date Metals Analyzed	-		01/29/1998					
Date Organics Analyzed	-							
Date PCBs Analyzed	-	01/18/1998	01/20/1998	01/20/1998	01/20/1998	01/18/1998	01/17/1998	
Date Semi-volatile Organics Analyzed	-							
Arsenic	mg/kg							
Barium	mg/kg							
Cadmium	mg/kg			0.052				
Chromium	mg/kg							
Lead	mg/kg							
Mercury	mg/kg							
Nickel	mg/kg							
Silver	mg/kg							
Zinc	mg/kg							
PCB 1248	µg/kg	702	18800	17000	5350	802	289	
PCB 1254	µg/kg	904	27100	23500	6440	696	346	
PCB 1260	µg/kg	734	34000	29700	5380	694	269	
Ignitability	Deg.			>200				
Total Organic Carbon	mg/kg							
Total Petroleum Hydrocarbons	mg/kg							
pH (Corrosivity)	-			0.6.3 NC				
Acenaphthene	µg/kg							
Acenaphthylene	µg/kg							
Anthracene	µg/kg							
Benzo[a]anthracene	µg/kg							
Benzo[a]pyrene	µg/kg							
Benzo[b]fluoranthene	µg/kg							
Benzo[ghi]perylene	µg/kg							
Benzo[k]fluoranthene	µg/kg							

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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION Willow Brook/Willow Pond

Page 23 of 36

Constituent	Location ID	WT-SD-43	WT-SD-44	WT-SD-45	WT-SD-46	WT-SD-47	WT-SD-48	WT-SD-49
Sample ID	1653103	1653108	1653104	1653105	1653127	1653106	1653107	
Sample Date	01/13/1998	01/13/1998	01/13/1998	01/13/1998	01/14/1998	01/13/1998	01/13/1998	
Sample Time	11:25	13:30	11:30	11:35	10:10	11:40	13:25	
Sample Depth								
Laboratory	accu	accu	accu	accu	accu	accu	accu	
Lab. Number	E29784-16	E29784-21	E29784-17	E29784-18	E29836-5	E29784-19	E29784-20	
Units								
Date Metals Analyzed	-				01/21/1998			
Date Organics Analyzed	-				01/16/1998			
Date PCBs Analyzed	-	01/17/1998	01/17/1998	01/17/1998	01/19/1998	01/20/1998	01/17/1998	
Date Semi-volatile Organics Analyzed	-				01/19/1998			
Arsenic	mg/kg				1.5			
Barium	mg/kg				37.7			
Cadmium	mg/kg				0.98			
Chromium	mg/kg				41.8			
Lead	mg/kg				153			
Mercury	mg/kg				0.18			
Nickel	mg/kg				36.4			
Silver	mg/kg							
Zinc	mg/kg				152			
PCB 1248	µg/kg	1560	159	1050	547	388	1620	1180
PCB 1254	µg/kg	1270	227	897	548	923	2840	875
PCB 1260	µg/kg	1000	141	1070	226	822	3130	406
Ignitability	Deg.							
Total Organic Carbon	mg/kg							
Total Petroleum Hydrocarbons	mg/kg					1160		
pH (Corrosivity)	-							
Acenaphthene	µg/kg					32400		
Acenaphthylene	µg/kg					2510		
Anthracene	µg/kg					95500		
Benzo[a]anthracene	µg/kg					208000		
Benzo[a]pyrene	µg/kg					183000		
Benzo[b]fluoranthene	µg/kg					147000		
Benzo[ghi]perylene	µg/kg					132000		
Benzo[k]fluoranthene	µg/kg					41200		

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SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

Page 24 of 36

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SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION Willow Brook/Willow Pond

Page 25 of 36

Location ID	WT-SD-50	WT-SD-51	WT-SD-52	WT-SD-53	WT-SD-54	WT-SD-55	WT-SD-56
Sample ID	1653087	1653128	1653129	1653130	1653131	1653132	1653133
Sample Date	01/12/1998	01/14/1998	01/14/1998	01/14/1998	01/14/1998	01/14/1998	01/14/1998
Sample Time	16:45	11:55	12:00	12:15	13:25	13:50	14:00
Sample Depth							
Laboratory	accu	accu	accu	accu	accu	accu	accu
Lab. Number	E29782-15	E29836-6	E29836-7	E29836-8	E29836-9	E29836-10	E29836-11
Constituent	Units						
Date Metals Analyzed	-						01/21/1998
Date Organics Analyzed	-						
Date PCBs Analyzed	-	01/20/1998	01/19/1998	01/19/1998	01/19/1998	01/19/1998	01/19/1998
Date Semi-volatile Organics Analyzed	-						01/16/1998
Arsenic	mg/kg						
Barium	mg/kg						27.6
Cadmium	mg/kg						1.3
Chromium	mg/kg						28.6
Lead	mg/kg						71.6
Mercury	mg/kg						0.52
Nickel	mg/kg						18.2
Silver	mg/kg						1.3
Zinc	mg/kg						76.8
PCB 1248	µg/kg	993	185	83000	759	2320	352
PCB 1254	µg/kg	4190	1820	215000	2840	13600	3200
PCB 1260	µg/kg	4780	631	29400	638	5850	736
Ignitability	Deg.						313
Total Organic Carbon	mg/kg						
Total Petroleum Hydrocarbons	mg/kg						296
pH (Corrosivity)	-						
Acenaphthene	µg/kg						
Acenaphthylene	µg/kg						47.8
Anthracene	µg/kg						53.4
Benzo[a]anthracene	µg/kg						221
Benzo[a]pyrene	µg/kg						283
Benzo[b]fluoranthene	µg/kg						259
Benzo[ghi]perylene	µg/kg						265
Benzo[k]fluoranthene	µg/kg						229

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SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

Page 26 of 36

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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION Willow Brook/Willow Pond

Page 27 of 36

	Location ID	WT-SD-57	WT-SD-58	WT-SD-59	WT-SD-67	WT-SD-68	WT-SD-69	WT-SD-70
Sample ID	1653134	1653135	1653136	1653122	1653074	1653078	1653073	
Sample Date	01/14/1998	01/14/1998	01/14/1998	01/13/1998	01/12/1998	01/12/1998	01/12/1998	
Sample Time	14:20	14:30	14:40	15:25	14:00	14:46	14:10	
Sample Depth							3'	
Laboratory	accu	accu	accu	accu	accu	accu	accu	
Lab. Number	E29836-12	E29836-13	E29836-14	E29784-35	E29782-1	E29782-6	E29782-2	
Constituent	Units							
Date Metals Analyzed	-							
Date Organics Analyzed	-							
Date PCBs Analyzed	-	01/19/1998	01/19/1998	01/20/1998	01/19/1998	01/19/1998	01/19/1998	
Date Semi-volatile Organics Analyzed	-							
Arsenic	mg/kg							
Barium	mg/kg							
Cadmium	mg/kg							
Chromium	mg/kg							
Lead	mg/kg							
Mercury	mg/kg							
Nickel	mg/kg							
Silver	mg/kg							
Zinc	mg/kg							
PCB 1248	µg/kg	42.1	81	114	19400	28300	936	18400
PCB 1254	µg/kg	170	357	578	27700	33100	9270	20000
PCB 1260	µg/kg	39.8	80.4	186	15300	16500	5180	9800
Ignitability	Deg.							
Total Organic Carbon	mg/kg							
Total Petroleum Hydrocarbons	mg/kg							
pH (Corrosivity)	-							
Acenaphthene	µg/kg							
Acenaphthylene	µg/kg							
Anthracene	µg/kg							
Benzo[a]anthracene	µg/kg							
Benzo[a]pyrene	µg/kg							
Benzo[b]fluoranthene	µg/kg							
Benzo[ghi]perylene	µg/kg							
Benzo[k]fluoranthene	µg/kg							

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SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

Page 28 of 36

[illegible]

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SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION Willow Brook/Willow Pond

Page 29 of 36

Location ID	WT-SD-71	WT-SD-72	WT-SD-72	WT-SD-73	WT-SD-73	WT-SD-74	WT-SD-74
Sample ID	1653121	1655941	1655946	1655935	1655936	1655930	1655932
Sample Date	01/13/1998	03/18/1998	03/18/1998	03/18/1998	03/18/1998	03/18/1998	03/18/1998
Sample Time	15:20	13:50	13:55	12:15	12:16	11:25	11:27
Sample Depth		0' - 2'	10' - 12'	0' - 2'	0' - 2'	0' - 2'	4' - 6'
Laboratory	accu	accu	accu	accu	accu	accu	accu
Lab. Number	E29784-34	E32169-12	E32169-17	E32169-6	E32169-7	E32169-1	E32169-3
Constituent	Units						
Date Metals Analyzed	-						
Date Organics Analyzed	-						
Date PCBs Analyzed	-	01/20/1998	03/26/1998	03/26/1998	03/26/1998	03/25/1998	03/24/1998
Date Semi-volatile Organics Analyzed	-						
Arsenic	mg/kg						
Barium	mg/kg						
Cadmium	mg/kg						
Chromium	mg/kg						
Lead	mg/kg						
Mercury	mg/kg						
Nickel	mg/kg						
Silver	mg/kg						
Zinc	mg/kg						
PCB 1248	µg/kg	23500	126000	18100	19700	1300	33
PCB 1254	µg/kg	25400	115000	20800	21400	1710	40.4
PCB 1260	µg/kg	18700	17200	10200	9850	1010	24.8
Ignitability	Deg.						
Total Organic Carbon	mg/kg		115000	117000	124000	134000	
Total Petroleum Hydrocarbons	mg/kg						
pH (Corrosivity)	-						
Acenaphthene	µg/kg						
Acenaphthylene	µg/kg						
Anthracene	µg/kg						
Benzo[a]anthracene	µg/kg						
Benzo[a]pyrene	µg/kg						
Benzo[b]fluoranthene	µg/kg						
Benzo[ghi]perylene	µg/kg						
Benzo[k]fluoranthene	µg/kg						

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Page 30 of 36

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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION **Willow Brook/Willow Pond**

Page 31 of 36

	Location ID	WT-SD-75	WT-SD-75	WT-SD-75	WT-SD-76	WT-SD-76	WT-SD-77	WT-SD-78
Sample ID	1655917	1655919	1655920	1655955	1655956	1655748	1655748	1655741
Sample Date	03/17/1998	03/17/1998	03/17/1998	03/18/1998	03/18/1998	03/17/1998	03/17/1998	03/17/1998
Sample Time	16:00	16:02	:	15:09	15:10	15:10	15:10	14:01
Sample Depth	0' - 2'	4' - 6'	6' - 8.0'	0' - 2'	2' - 4'	0' - 2'	0' - 2'	2' - 4'
Laboratory	accu	accu	accu	accu	accu	accu	accu	accu
Lab. Number	E32168-24	E32168-26	E32168-27	E32169-26	E32169-27	E32168-14	E32168-7	
Constituent	Units							
Date Metals Analyzed	-							
Date Organics Analyzed	-							
Date PCBs Analyzed	-	03/26/1998	03/26/1998	03/26/1998	03/26/1998	03/25/1998	03/25/1998	
Date Semi-volatile Organics Analyzed	-							
Arsenic	mg/kg							
Barium	mg/kg							
Cadmium	mg/kg							
Chromium	mg/kg							
Lead	mg/kg							
Mercury	mg/kg							
Nickel	mg/kg							
Silver	mg/kg							
Zinc	mg/kg							
PCB 1248	µg/kg	19700	21.6	3080	57.9	27200	39200	
PCB 1254	µg/kg	28600	37	4460	200	20300	30600	
PCB 1260	µg/kg	19400		3500	47	3680	3920	
Ignitability	Deg.							
Total Organic Carbon	mg/kg	162000				50700		
Total Petroleum Hydrocarbons	mg/kg							
pH (Corrosivity)	-							
Acenaphthene	µg/kg							
Acenaphthylene	µg/kg							
Anthracene	µg/kg							
Benzof[a]anthracene	µg/kg							
Benzof[a]pyrene	µg/kg							
Benzof[b]fluoranthene	µg/kg							
Benzof[ghi]perylene	µg/kg							
Benzof[k]fluoranthene	µg/kg							

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SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION **Willow Brook/Willow Pond**

Page 33 of 36

	Location ID	WT-SD-78	WT-SD-79	WT-SD-79	WT-SD-79	WT-SD-92	WT-SD-92	WT-SD-93	WT-SD-93
Sample ID	1655743	1655735	1655737	1655690	1655691	1655692	1655693	1655692	1655693
Sample Date	03/17/1998	03/17/1998	03/17/1998	03/13/1998	03/13/1998	03/13/1998	03/13/1998	03/13/1998	03/13/1998
Sample Time	14:03	12:00	12:02	14:10	14:15	14:25	14:30	14:25	14:30
Sample Depth	8.0' - 9.5'	0' - 2'	4' - 6'	0' - .5'	1.5' - 2.0'	0.0' - 0.5'	1.5' - 2.0'	0.0' - 0.5'	1.5' - 2.0'
Laboratory	accu	accu	accu	accu	accu	accu	accu	accu	accu
Lab. Number	E32168-9	E32168-1	E32168-3	E32062-18	E32062-19	E32062-20	E32062-21	E32062-20	E32062-21
Constituent	Units								
Date Metals Analyzed	-								
Date Organics Analyzed	-								
Date PCBs Analyzed	-	03/21/1998	03/25/1998	03/21/1998	03/24/1998	03/21/1998	03/19/1998	03/21/1998	03/19/1998
Date Semi-volatile Organics Analyzed	-								
Arsenic	mg/kg								
Barium	mg/kg								
Cadmium	mg/kg								
Chromium	mg/kg								
Lead	mg/kg								
Mercury	mg/kg								
Nickel	mg/kg								
Silver	mg/kg								
Zinc	mg/kg								
PCB 1248	µg/kg	179	32500	151	113000	809	10700	1980	1980
PCB 1254	µg/kg	155	32500	132	150000	1260	22500	2330	2330
PCB 1260	µg/kg	52.5	4600	112	36000	509	12700	1350	1350
Ignitability	Deg.								
Total Organic Carbon	mg/kg		159000			193000			
Total Petroleum Hydrocarbons	mg/kg								
pH (Corrosivity)	-								
Acenaphthene	µg/kg								
Acenaphthylene	µg/kg								
Anthracene	µg/kg								
Benzo[a]anthracene	µg/kg								
Benzo[a]pyrene	µg/kg								
Benzo[b]fluoranthene	µg/kg								
Benzo[ghi]perylene	µg/kg								
Benzo[k]fluoranthene	µg/kg								

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SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

Page 34 of 36

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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

Page 35 of 36

	Location ID	WT-SD-95	WT-SD-95	WT-SD-95					
	Sample ID	1655694	03/13/1998	14:40	1.5' - 2.0'	accu	E32062-23		
	Sample Date	03/13/1998	14:40	1.5' - 2.0'	accu	E32062-23			
	Sample Time	03/13/1998	14:40	1.5' - 2.0'	accu	E32062-23			
	Sample Depth	0.0' - 0.5'	accu	E32062-23					
	Laboratory								
	Lab. Number								
Constituent	Units								
Date Metals Analyzed	-								
Date Organics Analyzed	-								
Date PCBs Analyzed	-	03/19/1998	03/21/1998						
Date Semi-volatile Organics Analyzed	-								
Arsenic	mg/kg								
Barium	mg/kg								
Cadmium	mg/kg								
Chromium	mg/kg								
Lead	mg/kg								
Mercury	mg/kg								
Nickel	mg/kg								
Silver	mg/kg								
Zinc	mg/kg								
PCB 1248	µg/kg	24500	1990						
PCB 1254	µg/kg	16400	2180						
PCB 1260	µg/kg	2730	457						
Ignitability	Deg.								
Total Organic Carbon	mg/kg		272000						
Total Petroleum Hydrocarbons	mg/kg								
pH (Corrosivity)	-								
Acenaphthene	µg/kg								
Acenaphthylene	µg/kg								
Anthracene	µg/kg								
Benzo[a]anthracene	µg/kg								
Benzo[a]pyrene	µg/kg								
Benzo[b]fluoranthene	µg/kg								
Benzo[ghi]perylene	µg/kg								
Benzo[k]fluoranthene	µg/kg								

Notes: 1. Only Detects Shown
2. Printed on 04/15/98

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Table 2

SUMMARY OF SAMPLING AND ANALYTICAL INFORMATION (DETECTS) - INITIAL AND SUPPLEMENTAL INVESTIGATION

Willow Brook/Willow Pond

[illegible]

Notes: 1. Only Detects Shown
2. Printed on 04/15/98

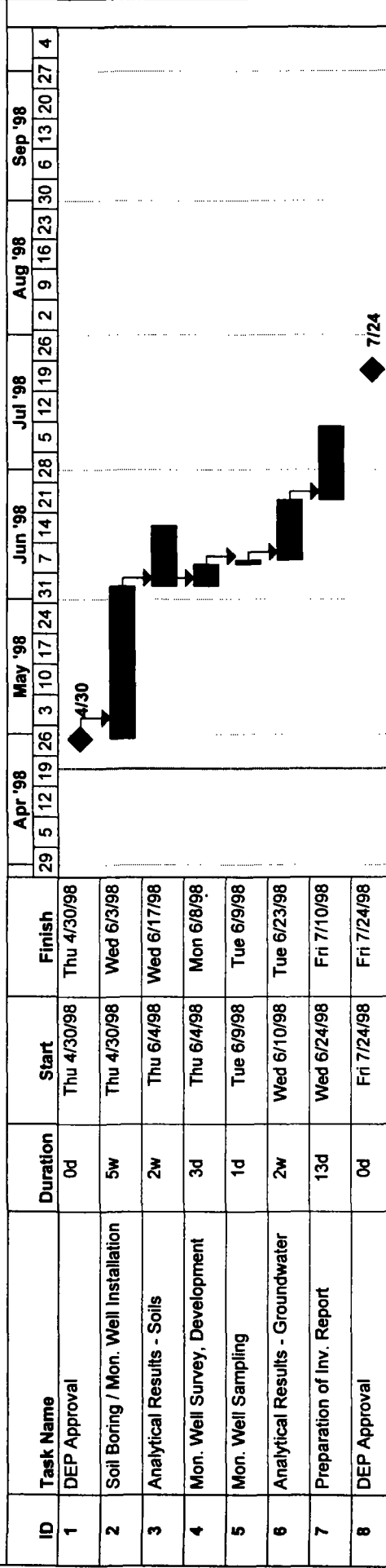
FIGURE 1

Timeline

Willow Brook/Willow Brook Pond Supplemental Investigation

FIGURE 1

**WILLOW BROOK / WILLOW BROOK POND
SUPPLEMENTAL PCB INVESTIGATION (Stage 3)**



Project: timeLn3.MPP Date: Thu 4/23/98	Task	Summary	Rolled Up Progress
	Progress	Rolled Up Task	
	Milestone	Rolled Up Milestone	

GP/PROJECT/06/07/07 06:03:00 PM Thu 4/23/98 2:08 PM

DRAWINGS